

Research Summary

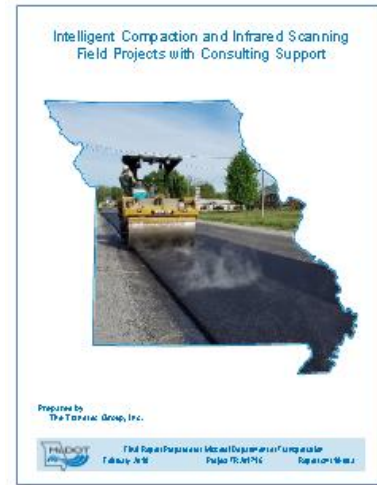
Intelligent Compaction-Infrared (IC-IR) Implementation in Missouri

The Missouri Department of Transportation (MoDOT) was awarded funding from the FHWA Accelerated Innovation Deployment (AID) program in 2016. MoDOT provided the required matching funding to support Intelligent Compaction (IC) and Infrared Scanning (IR) field projects with consulting support in 2017.

The consulting support provided by The Transtec Group included the development of MoDOT IC-IR protocols and training materials, conducting IC-IR training, on-site technical support to IC-IR field projects, analysis of IC-IR field data and reports.

The first MoDOT IC-IR contract (Phase I), funded by the AID grant and matching funds, included support for ten field projects. The second MoDOT IC-IR contract (Phase II) was funded by MoDOT to add support tasks for three additional IC-IR field projects. Therefore, a total of thirteen IC-IR field projects were performed under these two contracts.

The main goal of this project was to demonstrate the **usage of IC, IR, and the Veta software to improve construction quality control and efficiency** to make pavements last longer and to reduce maintenance cost.



Lessons Learned

Through this project, MoDOT gained valuable insights with regard to the utilization of IC-IR. The following were some of the lessons learned:

- The MoDOT IC-IR projects in 2017 can be considered a success in terms of building up experience for both MoDOT personnel and contractors.
- The IC-IR project protocol proved to be effective for planning and conducting field projects. The IC-IR data management is a key component of the protocol. It ensures a consistent data naming convention and submission. The MoDOT SharePoint site was very useful for sharing data files, especially when the file sizes were too large to send as email attachments.
- The IR implementation has shown itself to be a real-time indicator of any temperature segregation. In turn, the IR data and analysis reports can be used to fine tune the paving process accordingly, such as making use of a material transfer device (MTV) and adjustment of the truck fleet and paving speeds.
- Improved calibration and enhanced training will help address any issues related to IR DMI/data sampling of a vendor systems or analysis issues with vendor software.



- The IC implementation has been utilized to maximize roller coverage with some exceptions. Any coverage issues can be resolved by planning the construction operations based on project location and alignment, lift thickness to be constructed, type of materials, and availability of equipment and resources, along with proper training.
- Issues with IC roller calibration can be overcome with additional vendor training.
- The GPS boundary measurements were successful with occasional issues that required sorting, inspection, and correction.
- The IC-IR data management is still tedious, especially when IC or IR data needs to be exported or transferred manually. There were occasional human errors that caused incorrect file naming conventions. Ongoing training with the protocol and additional experience will resolve these issues.
- There was still a lack of submission of checklists, forms, and paving records to the SharePoint site.
- Most of core data was not submitted to the SharePoint site.

The final deliverable training was held on March 14, 2018 for MoDOT staff and contractors. MoDOT also conducted a very successful “Industry Feedback” meeting to share “Lessons Learned” and to receive industry feedback in order to improve future IC-IR projects.

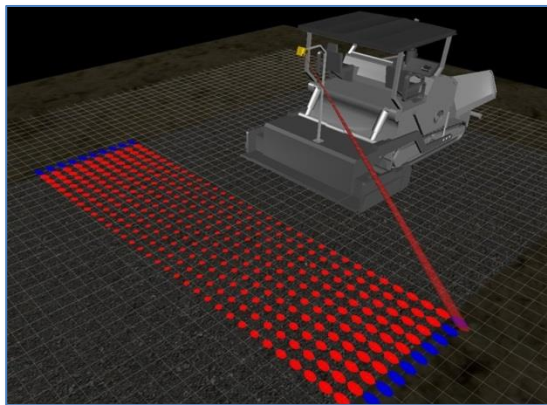


Illustration of an IR System. Courtesy of MOBA.

Project Information

PROJECT NAME: IC-IR Consultant Contract Phases I and II

PROJECT START/END DATE: December 2016-March 2018

PROJECT COST: \$250,000 (Phase I, AID award); \$53,092 (Phase II, SPR)

LEAD CONTRACTOR: The Transtec Group

PRINCIPAL INVESTIGATOR: George Chang

REPORT NAME: [Intelligent Compaction and Infrared Scanning Field Projects with Consulting Support](#) (MoDOT report)

[Accelerated Innovation Deployment \(AID\) Demonstration Project: Intelligent Compaction and Infrared Scanning Projects](#) (FHWA report)

REPORT NUMBER: cmr 18-003 (MoDOT)

REPORT DATES: February and March 2018

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